

## SECTION 713 PERMANENT TAPE STRIPES AND MARKINGS

### **713-1 Description.**

Apply permanent tape traffic stripes and markings, in accordance with the Contract documents. Stripes and markings are divided into two classes, Standard and High Performance, they are differentiated by their retroreflectivity and durability.

### **713-2 Materials.**

Use only permanent tape traffic stripes and markings materials listed on the Qualified Products List (QPL), meeting the requirements of 971-1 and 971-8. The Engineer will take random samples of the materials in accordance with the Department's Sampling, Testing and Reporting Guide schedule.

### **713-3 Equipment.**

Use equipment that is mobile and maneuverable to the extent that straight lines can be followed and normal curves can be made in a true arc.

Ensure the mechanical applicator is equipped with film cut-off device and a measuring device that automatically and accumulatively measures the length of each line placed with an accuracy tolerance of  $\pm 2$  percent. Tape may be placed by hand on short sections 500 feet or less if the tolerances in dimensions and in alignment specified in 710-5 are met.

### **713-4 Application.**

**713-4.1 Removal of Existing Traffic Stripes:** Remove existing traffic stripes and markings, such that scars or traces of removed markings will not conflict with new stripes and markings by a method approved by the Engineer.

Before applying traffic stripes and markings, remove any material by a method approved by the Engineer that would adversely affect the bond of the traffic stripes.

Apply a primer, sealer or surface preparation adhesive of the type recommended by the manufacturer. Ensure the tape stripes and markings adheres to the pavement surface.

Offset longitudinal lines at least 2 inches from construction joints on portland cement concrete pavement.

Apply traffic stripes or markings only to dry surfaces, and when the ambient air and surface temperature is at least 55°F and rising.

Apply striping to the same tolerances in dimensions and in alignment specified in 710-5. When applying traffic stripes and marking over existing markings, ensure that not more than 2 inches on either end and not more than 1 inch on either side of the existing line is visible.

Apply traffic stripes and markings to the pavement by means approved by the Engineer. The stripes and markings shall be installed immediately following the paving operation. Conduct field testing in accordance with FM 5-541 and FM 5-579. Remove and replace pavement stripes and markings not meeting the requirements of this Section at no additional cost to the Department.

Apply all final pavement markings prior to opening the road to traffic.

**713-4.2 Thickness:** Apply traffic stripes or markings such that, the stripes or markings will have a thickness above the pavement surface as designated on the Qualified Products List for the particular product used.

### **713-4.3 Retroreflectivity:**

**713-4.3.1 General:** Black portions of contrast tapes and black masking tapes must be non-reflective and have a reflectance of less than 5 mcd/lx m<sup>2</sup>.

**713-4.3.2 Standard Markings:** Apply white and yellow traffic stripes and markings that will attain an initial retroreflectivity of not less than 300 mcd/lx·m<sup>2</sup> for white and contrast markings and not less than 250 mcd/lx·m<sup>2</sup> for yellow markings.

**713-4.3.3 High Performance Markings:** Apply white and yellow traffic stripes and markings that will attain an initial retroreflectivity of not less than 450 mcd/lx·m<sup>2</sup> for white and contrast markings and not less than 350 mcd/lx·m<sup>2</sup> for yellow markings.

**713-4.4 Color:** Use material meeting the requirements of 971-1.

### **713-5 Contractor's Responsibility for Notification.**

Notify the Engineer prior to the placement of pavement stripes and marking material. Furnish the Engineer with the manufacturer's name and LOT numbers of the material to be used. Ensure that the approved LOT numbers appear on the material packages. Submit a certified test report to the Engineer indicating that the materials meet all requirements specified.

### **713-6 Protection of Newly Applied Stripes.**

Do not allow traffic onto or permit vehicles to cross onto newly applied traffic stripes and markings until they are sufficiently bonded. Remove and replace any portion of the traffic stripes and markings damaged by passing traffic or from any other cause, at no additional cost to the Department.

### **713-7 Observation Period.**

Pavement markings are subject to a 180 day observation period under normal traffic. The observation period shall begin with the satisfactory completion and acceptance of the work.

The pavement markings shall show no signs of failure due to blistering, excessive cracking, chipping, discoloration, poor adhesion to the pavement, loss of reflectivity or vehicular damage. The Department reserves the right to check the color and retroreflectivity within 30 days prior to the end of the observation period.

Replace, at no additional expense to the Department, any pavement markings that do not perform satisfactorily under traffic during the 180 day observation period.

### **713-8 Corrections for Deficiencies.**

Remove and reapply a 1.0 mile LOT centered around any deficiency, as determined by the Engineer, at no additional cost to the Department.

### **713-9 Method of Measurement.**

The quantities to be paid for under this Section will be as follows:

(a) The net length, in feet, of each of the various types of lines and stripes, authorized and acceptably applied.

(b) The total traversed distance in gross miles of 10-30 skip line. The actual applied line is 25% of the traverse distance for a 1:3 ratio. This equates to 1,320 feet of marking per mile of single line.

(c) The area, in square feet, of Remove Existing Markings acceptably removed.

(d) The length, in net miles, of Solid Traffic Stripe, authorized and acceptably applied.

(e) The number of pavement messages, symbols and directional arrows, authorized and acceptably applied.

**713-10 Basis of Payment.**

Prices and payments will be full compensation for all work specified in this Section, including, all cleaning and preparing of surfaces, furnishing of all materials, application, curing and protection of all items, protection of traffic, furnishing of all tools, machines and equipment, and all incidentals necessary to complete the work. Final payment will be withheld until all deficiencies are corrected.

Payment will be made under:

Item No. 713-101- Permanent Tape (Standard).

Item No. 713-102- Permanent Tape (High Performance).